

Exercises Sheet #2

Exercise 1 (Logistic regression)

A study was designed to compare HB drink commercials. Each participant was shown the commercials, A and B, in random order and asked to select the better one. There were 140 women and 130 men who participated in the study. Commercial A was selected by 65 women and by 67 men.

- 1) Find the odds of selecting Commercial A for the men.
- 2) Do the same for the women.
- 3) Find the estimates b_0 and b_1 and give the fitted logistic model.
- 4) What is the estimated odds ratio for a male to choose Commercial A ($x=1$) versus a female to choose Commercial A ($x=0$)?

Exercise 2 (KNN)

Consider the two animal species, *crocodiles* and *alligators*.

We suppose that they can be distinguished by measuring the *width* of their *mouth* and the *length* of their *body*.

Mouth width	Body length	class
0.17	2.84	alligator
0.24	3.82	alligator
0.24	3.39	alligator
0.2	2.60	alligator
0.25	4.21	crocodile
0.47	4.64	crocodile
0.47	4.48	crocodile
0.49	4.9	crocodile
0.46	4.08	crocodile

We add an animal with known characteristics but not species

New animal : *Mouth* = 0.19, *Body length* = 2.91

Question : Using KNN algorithm (with Euclidean distance), determine the class (species) of this animal for $K = 1$.